



Weather Home Companion

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Unprecedented Flooding of 2008

John Haase

Major to record flooding occurred during the month of June 2008 with most river forecast points above flood stage for the majority of the month. This flooding was even more widespread and severe than that which occurred in April 2008, which was the most prolific flood event since 1997.

While some locations were already experiencing flooding as June began, many of the tributary rivers to the Mississippi River in Iowa rose above flood stage during the first few days of the month. At locations that were already above flood stage, the rivers stopped their fall and began climbing again.

Persistent heavy rain from late May into early June resulted in record crests on the Cedar and Iowa Rivers in Iowa as well as other tributary rivers to the Mississippi River in eastern Iowa and southern Wisconsin. This resulted in record flooding on parts of the Mississippi River,



Cedar River running over Interstate 80 in eastern Iowa June 13, 2008. This flooding and interstate closure lasted 5 days, from June 6 through 12th, and required a 115 mile detour for interstate travelers. (Photo Credit: Kevin Arrowsmith, Iowa Department of Transportation)

even exceeding flood levels reached during the Great Flood of 1993 in some locations.

Both the Mississippi River and the Rock River in Illinois rose above flood stage at most loca-

tions around June 10th. Most locations on the tributary rivers and the Mississippi River fell below flood stage during the last two-thirds of the month.

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Weather Home Companion is a semiannual publication of the National Weather Service office in the Quad Cities.

If you have an idea for an article or a question you would like to see answered, please write to us.

Contact information can be found on page 6.

Farewell Jeff... Welcome Maren

Steve Kuhl

Jeff Zogg, NWS Quad Cities Service Hydrologist from September 1998 to September 2008, has received a promotion and transferred to the NWS Office in Des Moines, Iowa. Jeff did a fantastic job while working in Davenport, and we wish him and his family the best of luck as they begin their new life in Des

Moines.

We are pleased to announce that Maren Stoflet has been selected as the new Service Hydrologist to replace Jeff. Prior to coming to the Quad Cities, Maren worked as a General Forecaster at the NWS Office in Kansas City, MO, where she also served as the Hydrology

Focal Point. Maren began her NWS career as a Meteorologist Intern at the NWS Office in Springfield, MO, and holds a Bachelor of Science Degree in Atmospheric Science from the University of Wisconsin. Maren reported to work the last week of November.

Record River Levels

Cedar River at Cedar Rapids:

31.12 ft 6/13/2008

20.00 ft* 6/1/1851

12.00 ft flood stage

Iowa River at Iowa City:

31.53 ft 6/15/2008

28.52 ft* 8/10/1993

22 ft flood stage

Iowa River at Columbus Junction:

32.49 ft 6/16/2008

28.30 ft* 7/7/1993

19.00 ft flood stage

*Previous Records

Damage Estimates*

Cedar Rapids: \$750 million

Iowa City: \$230 million

Total Flood Damage Midwest Floods: More than \$5 Billion

***Preliminary**

Unprecedented Flooding of 2008

(continued from page 1)

The Cedar, Iowa and Mississippi Rivers were hardest hit by this flooding. The Mississippi River was most affected downstream of New Boston Lock and Dam 17. All forecast points on the Cedar and Iowa Rivers saw record crests during the month. Three locations on the Mississippi River downstream of New Boston Lock and Dam 17 saw record crests. In some locations, the new record crests were considerably higher than the previous record crests.

The most significant example was the Cedar River at Cedar Rapids. The crest during this event was 31.12 ft set on June 13, 2008. The previous record crest was 20.00 feet set on June 1, 1851. Flood stage is 12 feet. The record crest on the Iowa River at Columbus Junction occurred on June 16, 2008 at 32.49 feet. Flood stage is 19 feet. The record crest on the Iowa River at Iowa City occurred on June 15, 2008 at 31.53 feet. Flood stage is 22 feet.

Cedar River

The crest on the Cedar River became increasingly higher as it moved downstream through eastern IA from Waterloo, IA because of additional rainfall. Additional heavy rainfall occurred on the flood crest as it passed from Waterloo to Cedar Rapids. To make matters worse, heavy rainfall and flash flooding occurred in Cedar Rapids as the river was cresting. Unprecedented flooding occurred at many locations along the Cedar River, including the cities of Vinton and Cedar Rapids. According to the Cedar Rapids media, very preliminary damage estimates from this flood are estimated to be at least \$750 million in that area alone. The damage estimate may go much higher.



Flooding in Oakville, Iowa at the Iowa River on June 15, 2008.
(Photo Credit: Iowa Department of Homeland Security and Emergency Management)

Iowa River

On the Iowa River, water flowed over the spillway at the Corps of Engineer's Coralville Reservoir for only the third time since the reservoir began operation on September 17, 1958. (The other two times occurred during the Great Flood of 1993.)

Unprecedented flooding occurred downstream of Coralville Reservoir including the cities of Iowa City and Coralville. The University of Iowa in Iowa City sustained serious damage due to the flooding. The latest damage estimate from the University of Iowa is \$230 million, which is much higher than the \$6 million in damages that occurred during the Great Flood of 1993.

Flooded Roads

Many roads in eastern Iowa and northwest Illinois sustained severe damage from the flooding. The flooding also forced the closure of many roads including I-80, I-380 and US 34. On I-80, flood waters from the Cedar River flowed over the interstate resulting in its closure between mile markers 265 and 267 (between Davenport and Iowa City) from June 6 through the 12th. The detour route from US 61 to US 20, to I-35 added

115 miles to the normal route.

In addition, flooding from Coralville Reservoir resulted in the closure of I-380 between interchanges 4 and 10, between Iowa City and Cedar Rapids. The detour route for I-380, designated as I-80 west to I-35 north to US 20 east to I-380 south, added 272 miles to the normal route.

As the record flooding pushed downstream on the Cedar and Iowa Rivers, it continued to result in unprecedented impacts at many locations along those rivers. Several levee breaches occurred on the Iowa River below Columbus Junction, and the Mississippi River below New Boston IL Lock and Dam 17. A levee breach on the Mississippi River affected the Burlington area. On the Illinois side of the river, a levee breach resulted in the flooding of Gulfport, IL and the closure of the US Hwy 34 bridge.

More Improvements for the WSR-88D Doppler Radar

Ray Wolf

The latest in a long line of continuing upgrades to the National Weather Service's WSR-88D Doppler weather radar was installed at Davenport and neighboring NWS offices this past summer. This latest improvement is known as super-resolution data. Basically, through changes made to computer software within the radar system, the detail the radar can see has improved dramatically. This has increased our ability to detect tornadoes and other severe weather phenomena, as we have already observed last July and August.

Higher Resolution

First, the width of the radar beam has effectively decreased from 1° to 0.5° . So at a distance of 50 miles from the radar, the radar beam has decreased from around 5,000 feet wide to about 2,500 feet. In addition, the resolution along the beam has increased by a factor of 4 for reflectivity. This means the radar data we use for warning decisions and forecasting are more than 4 times more detailed than before.

Reflectivity

Figure 1 shows an example of a super resolution reflectivity image from around 2 pm July 11, 2008. Reflectivity is the amount of energy transmitted from the radar then reflected by rain, snow, hail, and other small objects back to the radar. This particular image shows a reflectivity hook over northern Clinton County, Iowa. Warmer colors (yellows-reds) indicate areas of heavier precipitation, possibly including hail, while cooler colors indicate areas of lighter precipitation. Reflectivity hook signatures are commonly associated with tornadoes, and the super resolution data allows us to see these features more clearly. The tornado associated with this

storm was rated EF0 based on the damage it caused, meaning winds of 60-80 mph occurred.

Velocity

The velocity data at this same time is also amazing in its detail. Green indicates motion toward the radar (located at the bottom of the image in figure 2), while red indicates motion away from the radar. The brighter the colors, the stronger the wind. The low-level mesocyclone indicated in figure 2 would be seen visually as a rotating wall cloud, and in fact, a tornado was occurring at this time as well. The radar does not actually

see the tornado because it is so small. However, the circulation indicative of the tornado is shown where the bright green and bright red pixels are right next to each other.

Super resolution data is just the latest upgrade to the WSR-88D. An even more significant upgrade is coming within the next 2 years, known as dual polarization. This improvement will greatly increase our ability to *not overwarn* for severe thunderstorms containing hail, while also improving the radar estimates of rainfall.

...The radar data we use for warning decisions and forecasting are more than 4 times more detailed than before...

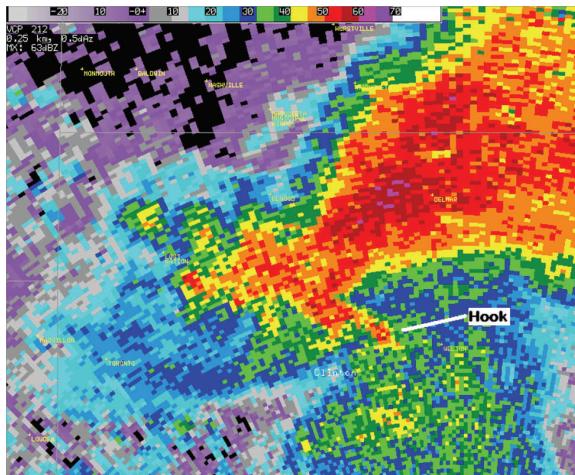


Figure 1.
Reflectivity image indicating a hook echo over Clinton County Iowa around 2 pm July 11, 2008.



Figure 2. Velocity image matching the time and location of the above reflectivity image. The low level meso is indicated by the side by side bright red and green pixels. These correspond to the hook echo seen in reflectivity.

...Super resolution data allows us to see these features more clearly...

COOP NEWS

Area Observers Recognized for Outstanding Service

Bill Elliott

John Campanius Holm Award Presented to Edward L. Schutte

...Mr. Schutte has been a Cooperative Observer for over 36 years...

Edward L. Schutte, (seen on the left) of Augusta, Illinois, accepts the John Campanius Holm Award for Outstanding Service to the National Weather Service. The award was presented by Steve Kuhl, Meteorologist-In-Charge, National Weather Service Quad Cities, IA. Mr. Schutte has been a Cooperative Observer for over 36 years.

Photo by Donna Dubberke, NWS Quad Cities Warning Coordination Meteorologist



John Campanius Holm Award Presented to Raymond R. Tull

...Mr Tull has been a Cooperative Observer for over 21 years...



Raymond R. Tull, of Donnellson, Iowa (second from the left), accepts the John Campanius Holm Award for Outstanding Service to the National Weather Service. Mr Tull has been a Cooperative Observer for over 21 years. The award was presented by Steve Kuhl, Meteorologist-In-Charge, NWS Quad Cities, IA. (second from the right). Also honoring Mr Tull's accomplishments were Harry Hillaker, Iowa State Climatologist (on the far left), and Bob Bonack, Central Region Headquarters (on the far right). *Photo by Donna Dubberke, NWS Quad Cities Warning Coordination Meteorologist*.

COOP News (continued from page 4)

Hohl's of Keosauqua Retiring After 31 Years of Service

Bill Elliott

Carl and Gladys Hohl of Keosauqua, Iowa are retiring after 31 years of volunteering to take daily weather observations for the National Weather Service. Carl started taking daily precipitation and temperatures readings in 1977 and has continued to do so for the last 31 years. Gladys has also taken part, calling in the observations and substituting for Carl when necessary.

They are just two of over 11,000 volunteer weather observers across the United States taking

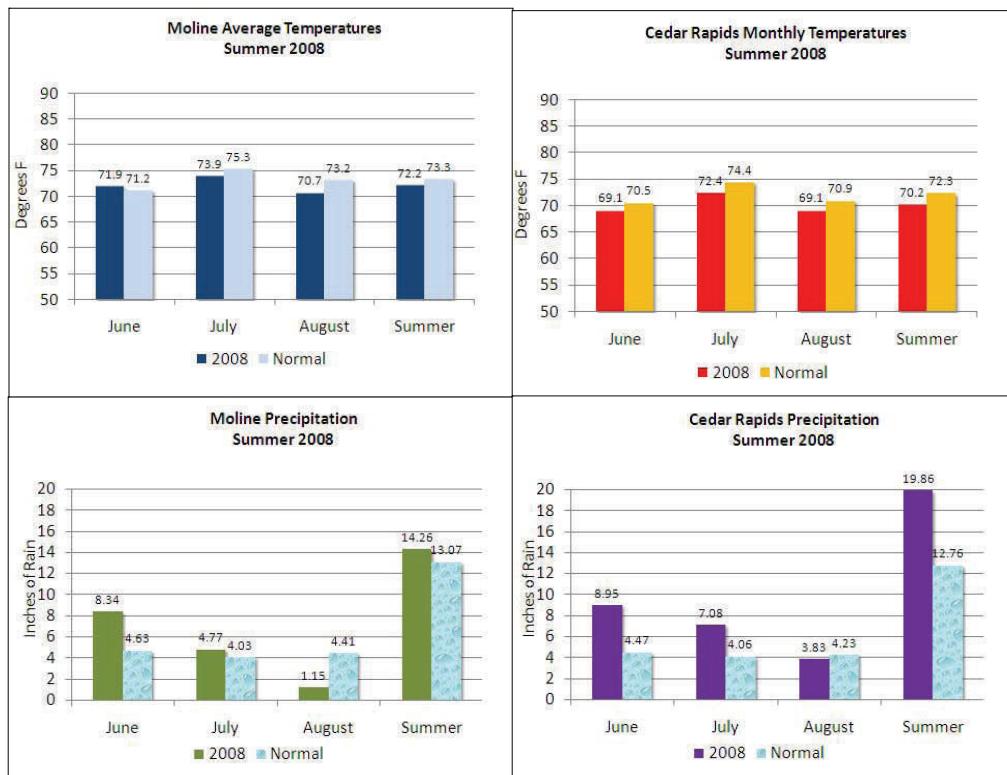
weather observations for the National Weather Service as part of the Cooperative Observer Program. The program dates back to Thomas Jefferson who kept a diary of daily weather observations for many years.

The National Weather Service would like to thank Mr. and Mrs. Hohl for their dedication and service to their community, state, and the nation.

...The NWS would like to thank Mr. and Mrs. Hohl for their dedication and service...

Summer 2008: Cool and Wet

David Sheets



The overall trend of below normal temperatures and above average precipitation that began last winter, continued through spring and summer 2008 for much of eastern Iowa and northwest Illinois. The above graphs indicate the summer months of June, July and August were cooler than average at both Moline and Cedar Rapids. Rainfall totals for June and July were well above average, while August ended with below normal totals at both Moline and Cedar Rapids. Cedar Rapids had 7 inches more rain than the 30 year average over the course of the summer, and had 5 1/2 more inches of rain than Moline.

...The trend of below normal temperatures and above average precipitation continued through spring and summer 2008...

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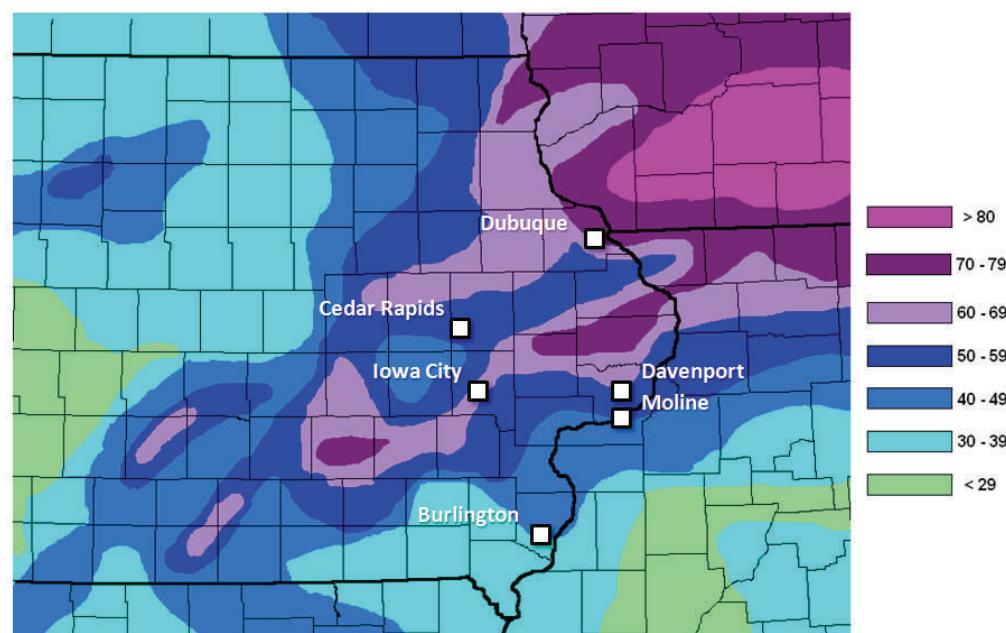
David Sheets, Forecaster

*Ray Wolf, Science Operations
Officer*

Record Snowfall of Winter 2007-2008

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David Sheets



The winter of '07-'08 was the snowiest on record at Dubuque, with a total of 78.7 inches for the season. Other sites that ranked in the top ten snowiest included Iowa City, 61.1 inches (3rd snowiest); Cedar Rapids, 56.3 inches (4th snowiest); and Moline, 51.5 (6th snowiest). Burlington had a total of 42.7 inches and the NWS in Davenport measured 63.3 inches.